JC Carter LLC
LNG Couplings

USER MANUAL

50 GPM Quick Disconnect
Liquefied Natural Gas Coupling

Models 50E701(-1) Nozzle and 62050 Receptacle

User's Manual and Installation Guide

Rev. E

! Warning: Read the User's Manual and Installation Guide. Follow all warning and safety instructions. Failure to do so may result in serious injury.

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Introducing the JC Carter LNG Couplings

Thank you for selecting JC Carter LNG Couplings. JC Carter Couplings offer the following features:

- No nitrogen purging is required for proper operation.
- Primary valve vehicle half – eliminates the need for manual valve operation during each fueling.
- Built-in compression fittings allow simple inexpensive vehicle installation.
- Patent pending, self cleaning, diametric sealing prevents liquid leakage while fueling.
- Couplings are easy to use and maintain.
- Unique Freeze-On-Free feature allows removal of nozzle from the receptacle under most weather conditions.
- Safety features prevent fuel flow while couplings are disconnected.
- Durable design protects against damage in the field.
- Extensive cycle life testing has shown the coupling to be reliable and long lasting.
- Model 50E701 Short Handle and 50E701-1 Long Handle

! Attention: This symbol will be used to point out important safety instructions. Please read this manual carefully before using couplings.

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Warnings and Safety Instructions

! Operator Safety:

1. Always wear protective clothing consisting of the following:
   - Full face shield
   - Thermal gloves rated for cryogenic use
   - Cryogenic smock
   - Solid shoes capable of withstanding cryogenic spillage

2. Read the User's Manual and Installation Guide completely before operating coupling.

3. Keep area of operation clear of all persons other than operator.

4. Use coupling only as described in this User's Manual, failure to do so may result in serious injury.

5. Do not use any attachments or accessories with coupling not supplied by JC Carter.

6. Do not operate coupling if damage has occurred. If damage has occurred use only JC Carter or JC Carter's approved source for repairs.

7. Maintenance and repairs should be done only by trained personnel using genuine JC Carter supplied replacement parts. Failure to comply will void the JC Carter warranty and exclude JC Carter from any responsibility.

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Description

The Refueling Nozzle:

JC Carter model 50E701(-1) is the nozzle half of the liquefied natural gas (LNG) coupling. The nozzle comes in two versions the first being 50E701 which has shorter handles, their length is 6 inches. The second offers a slightly longer handle at 8 inches and is designated as 50E701-1. The quick disconnect single line nozzle is intended for use in NO-VENT (top fill) LNG fuel systems. A key feature of this nozzle is the independent shut-off valve located in the flow path within the nozzle. The operator mates the nozzle 50E701(-1) to the receptacle model 62050 by pushing the two handles forward toward the LNG powered vehicle. The nozzle is locked on by way of the three (3) latches and fueling can now be started. When fueling is complete the operator simply returns the handles back, by pulling away from the vehicle, to their original position. This will stop the flow and the nozzle will unlock from the receptacle.

The Refueling Receptacle:

JC Carter model 62050 is the mating receptacle portion of the LNG fueling coupling. The receptacle mounts to the vehicle as described on pages 10-12 of this manual. The receptacle contains an independent primary shut-off valve.

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Installation Tools and Accessories

Tools:

Torque Wrench (120-130 Ft. Lb range) 1 Ea.

Adjustable Wrench 2 Ea.

Accessories:

50 GPM Nozzle Installation Kit Model Number B91546-1
(Consists of 1" Silver Plated Boss Seal
and 1" 37 Degree Flared Large Hex Fitting)

¼" – 20 Stainless Steel Bolts 4 Ea.

¼" – Stainless Steel Lock Washers 4 Ea.

¼" – Stainless Steel Nuts 4 Ea.

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Specifications

! Caution: Failure to adhere to the specification limits of this coupling may result in injury.

Fluid Compatibility: LNG, Methane and LN_2

Maximum Refueling Pressure: 250 psig

Maximum Working Pressure: 500 psig

Burst Pressure: 1500 psig

Rated Flow: 50 Gallons per Minute

Receptacle Weight: 4 Lbs

Nozzle Weight: 12 Lbs

Operating Temperature: -320°F to +120°F

Storage Temperature: -60°F to + 120°F

Spillage on De-Mating: < 1cc

Leakage While Fueling: None

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Nozzle Installation

Step 1:

! Caution: Open nozzle package only in a dry, protected area. Do not allow water or other contaminants to enter the internal mechanism of the coupling.

Remove the nozzle from the sealed packaging and pull the shipping plug from the nozzle port. Using installation kit B91546-1, position the nozzle upright with the poppet assembly facing downward. Place the boss seal in the nozzle port and thread the 37 degree flared fitting until bottomed. Be careful to not allow the threads of the flared fitting contact the boss seal. Once the flared fitting is bottom visually inspect to ensure an even alignment of the boss seal around the nozzle port. Torque the flared fitting to between 120 and 130 Ft. Lbs using the 1½" flats.

Step 2:

Purge the hose from the filling station to remove any contaminants and moisture that may have entered the lines.

! Caution: Failure to remove contaminants or moisture may affect the performance of the LNG coupling.

Step 3:

Connect the line from the LNG filling station to the straight thread connector installed in step 1. Torque the filling station hose to between 120 and 130 Ft. Lbs.

Step 4:

! Caution: This step is critical in assuring the safe performance of the LNG coupling.

Perform leak test of the LNG coupling, filling hose and adapters by pressurizing the upstream side of the filling station hose to 250 psig with Nitrogen gas. Verify the system is free from any leakage.

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Receptacle Installation

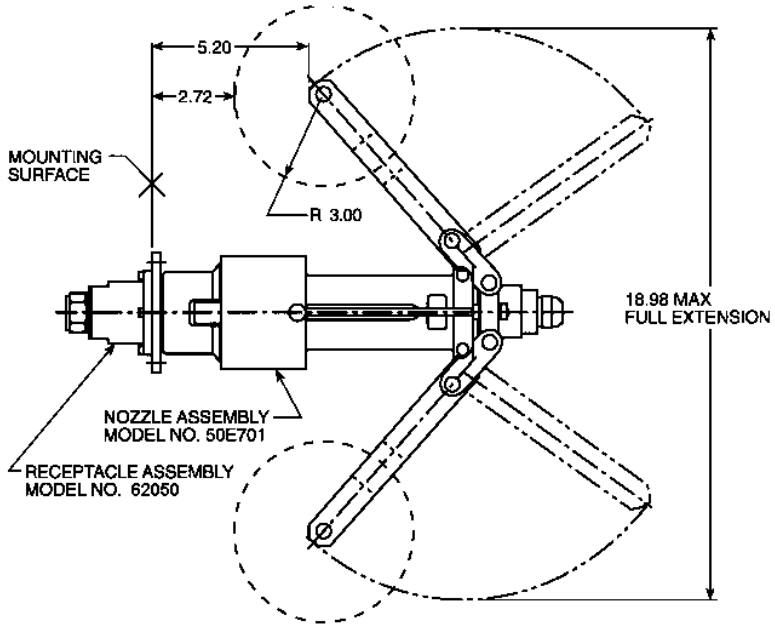
Step 1:

! <u>Caution:</u> Open receptacle packaging only in dry, protected area. Do not allow water or other contaminants to enter the internal mechanism of this coupling.

Remove the receptacle from the sealed packaging and remove the shipping plug from the receptacle outlet port.

Step 2:

Select an appropriate location on the LNG fueled vehicle to mount the receptacle based on the following envelope definition figures. The following two figures illustrate clearance needed to allow a proper nozzle to receptacle connection. The three inch radius shown about the top handle in the figure below depicts the recommended clearance to grip the handle during operation.



The following side view figure shows the overall dimensions of a mated nozzle and receptacle.

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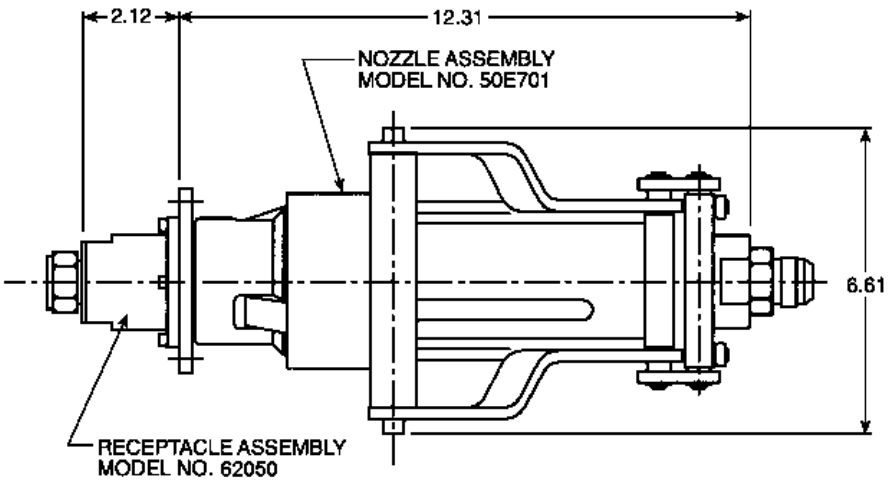
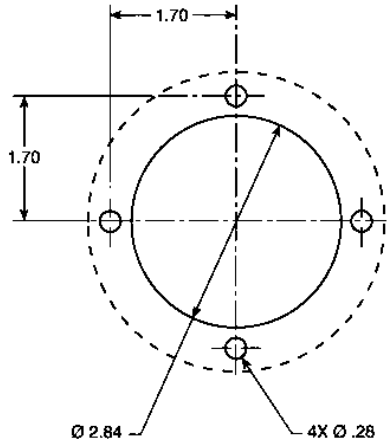


The following figure shows the mounting footprint of the receptacle. The circular cutout in the middle of the figure shows the clearance necessary for the fuel line. When choosing the mounting location, be sure that the mounting surface on the vehicle gives solid support to the bolt locations shown in the figure.



RECEPTACLE FOOTPRINT

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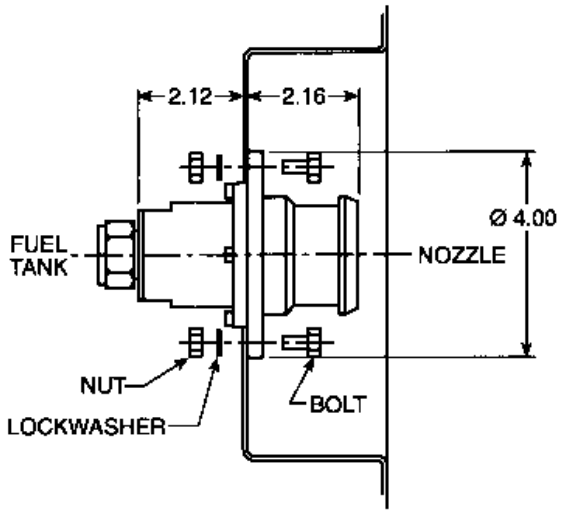
Step 3:

Mount the receptacle on the vehicle using the four ¼"-20 stainless steel bolts, lock washers and nuts. Place the bolts, washers and nuts as shown in the figure below with the bolt heads toward the outside of the mounting surface. Torque nuts to 75 In. Lb.



Step 4:

Insert the ¾" tubing into the receptacle fitting. Make sure that the tubing is firmly against the shoulder of the fitting. Finger tighten the fitting nut. Scribe the nut to note a location then tighten the nut one full revolution and go past ¼ turn.

Step 5:

! <u>Caution:</u> This step is critical in assuring safe performance of the LNG coupling. Leak testing should be performed monthly.

Perform initial leak test of the LNG receptacle by pressurizing the fueling system with Nitrogen gas and verify the system is free from any leakage. Be careful not to exceed the rated pressure of the fueling system when doing leak test.

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Operating Instructions

! **Caution: The operator must wear the protective clothing outlined in the Warnings and Safety Instructions on page three (3) of this manual. Failure to do so may result in injury. Never point the nozzle directly at yourself or others at anytime.**

Step 1:

Put on the following protective clothing:

- Full face shield
- Thermal gloves rated for cryogenic use
- Cryogenic smock
- Solid shoes capable of withstanding cryogenic spillage

Step 2:

If this is the first fueling of the day, check to be sure no fuel pressure is present at the nozzle. Then wipe out the mating end of the nozzle using a clean, dry cloth.

Step 3:

Remove the receptacle dust cap.

Step 4:

With the nozzle handles completely retracted toward the operator which allows the locking latches to open, insert the nozzle into the receptacle far enough for the locking mechanism to engage.

Step 5:

To start the flow push both handles forward simultaneously toward the receptacle. Pushing on the handles will cause them to rotate forward and will lock the nozzle as well as engage the poppet assembly.

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Step 6:

! <u>Caution:</u> Before removing the nozzle from the receptacle, the LNG supply should be turned off.

Once the LNG supply has been stopped, pull the control handles away from the receptacle. **While pulling back the operator should first stop at the intermediate stop point in order to relieve any line pressure.** This is done to prevent damage to the nose seal and to protect the operator from blow off. Once pressure is relieved the operator should continue to pull the handles until the mechanical hard-stop point, the locking mechanism will be disengaged and the nozzle can be removed from the receptacle.

Step 7:

Replace the dust cap to the receptacle.

Step 8:

Store the nozzle in a protected location free from moisture and debris. Preferably in the "Handles Up" orientation.

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Maintenance Schedule

Please note that JC Carter recommends the following maintenance schedule be followed to ensure trouble free operation and maximum life. Failure to follow the schedule may result in less than optimal performance or reduced operating life. All kits described in this section may be ordered by contacting JC Carter directly at +1 (949)764-2200.

Daily Maintenance:

At the start of each fueling day:

- Check to be sure no pressure is present in the nozzle
- Clean out the mating end of the nozzle with a clean, dry cloth.

Each Fueling:

Before each fueling:

- Clean out the cup of the receptacle with a clean dry cloth.

3 Months or 5,000 Fuelings:

Remove and replace the nozzle retaining rings, nozzle seals, and nozzle seal retainers. Use only JC Carter Nozzle Seal Replacement Kit part number B91548-1

20,000 Fuelings:

Perform 5,000 fuelings repair as well as replacing all nozzle linkage bushings. Use only JC Carter parts.

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